

What is claimed is:

1. An agitation mechanism for a gypsum processing apparatus comprising:
  - a housing having a top wall, a bottom wall, and at least one sidewall, the housing constructed and arranged to receive and process powdered gypsum;
  - a fluidization mechanism for delivering fluid to the gypsum based product, and
  - an agitator frame having a similarly shaped cross section to a cross section of the housing, the agitator frame pivotally connected internally to the housing for reciprocating movement between first and second positions, the agitation mechanism operable for preventing the fluidized gypsum product from collecting along a support base adjacent the bottom wall of the housing.
2. The apparatus of claim 1, wherein the agitation mechanism includes a plurality of agitation members connected to the agitator frame for agitating the gypsum product adjacent the support base when the agitator frame moves.
3. The apparatus of claim 1, wherein the reciprocating movement is a swinging movement.
4. The apparatus of claim 1, wherein the agitation mechanism includes at least one pivotable support arm for pivotally connecting the agitator frame to the apparatus.
5. The apparatus of claim 4, wherein the at least one pivotable support arm is a cable pivotally attached internally to the housing at one end and to the agitator frame at the other end, the agitator frame being operable for swinging about a pivot axis when motion is imparted thereto.
6. The apparatus of claim 1, wherein the agitation mechanism includes a power source to move the agitator frame.

7. The apparatus of claim 6, wherein the power source includes one of an electric motor and a powered air cylinder.
8. The apparatus of claim 7, further comprising:  
an actuator arm extending through the housing to provide a connection between the motor and the agitator frame.
9. The apparatus of claim 8, wherein the agitator mechanism further comprises:  
an expandable seal engaged with the actuator arm and the housing to prevent the gypsum product from leaking from the housing.
10. The apparatus of claim 9, wherein the seal expands and contracts as the actuator arm moves between first and second positions.
11. The apparatus of claim 8, wherein the actuator arm slidably engages through a side wall of the housing to connect the agitation mechanism to the motor.
12. The apparatus of claim 1, wherein the agitator frame corresponds to a housing having a rectangular cross section.
13. The apparatus of claim 1, wherein the agitator frame corresponds to a housing having a circular cross section.
14. The apparatus of claim 1, wherein the agitator frame corresponds to a housing having one of any geometric cross section constructed and arranged to process a gypsum based product.
15. The apparatus of claim 1, wherein the process includes calcining gypsum.
16. The apparatus of claim 1, wherein the apparatus is a fluidized bed stucco cooler utilizing water injection.

17. The apparatus of claim 1, wherein the apparatus is a fluidized bed stucco cooler utilizing cooling coils.

18. The apparatus of claim 1, wherein the apparatus is a post stucco treatment retention device.

19. An agitation mechanism for a fluidized gypsum processing apparatus comprising:

a housing having a top wall, a bottom wall, and at least one sidewall, the housing constructed and arranged to receive and process gypsum based products;

an agitator frame having a cross section of generally similar shape to a cross section of the housing, the agitator frame pivotally connected internally to the housing for reciprocating movement between first and second positions, the agitation mechanism operable for preventing fluid channeling, dead pockets of non fluidized gypsum, and for preventing the gypsum product from collecting adjacent the bottom wall of the housing; and

at least one pivotable support arm for pivotally connecting the agitator frame to the apparatus, wherein the at least one pivotable support arm is a cable pivotally attached internally to the housing at one end and to the frame at the other end, the agitator frame being operable for swinging about a pivot axis when motion is imparted thereto.

20. The apparatus of claim 19, wherein the agitation mechanism includes a plurality of agitation members connected to the agitator frame for agitating the gypsum product adjacent the bottom wall when the agitator frame moves.

21. The apparatus of claim 20, wherein the agitation members comprise cross members.

22. The apparatus of claim 19, wherein the agitation mechanism includes a power source to move the agitator frame.

23. The apparatus of claim 22, wherein the power source includes one of an electric motor and a pneumatic actuator.

24. The apparatus of claim 22, further comprising:  
an actuator arm extending through the housing to provide a connection between the power source and the agitator frame.

25. The apparatus of claim 24, wherein the actuator arm includes a plurality of mechanical linkages to connect the agitation mechanism to the power source.

26. The apparatus of claim 24, wherein the agitation mechanism further comprises:

an expandable seal engaged with the actuator arm and the housing to prevent the gypsum product from leaking from the housing.

27. The apparatus of claim 26, wherein the seal expands and contracts as the actuator arm moves between first and second positions.

28. The apparatus of claim 19, wherein a cross-section of the agitator frame corresponds to a housing having a rectangular cross section.

29. The apparatus of claim 19, wherein a cross-section of the agitator frame corresponds to a housing having a circular cross section.

30. The apparatus of claim 19, wherein a cross-section of the agitator frame corresponds to a housing having one of any geometric cross section constructed and arranged to process a gypsum based product.

31. The apparatus of claim 19, wherein the process includes calcining gypsum.

32. The apparatus of claim 19, wherein the apparatus is a fluidized bed stucco cooler utilizing water injection.

33. The apparatus of claim 19, wherein the apparatus is a fluidized bed stucco cooler utilizing cooling coils.

34. The apparatus of claim 19, wherein the apparatus is a post stucco treatment retention device.

35. A method for agitating a gypsum based material comprising the steps of:

providing a housing having a bottom wall for processing the gypsum material;

transferring the material from a source to the apparatus;

fluidizing the material by flowing fluid through the material; and

agitating the fluidized material with an agitation mechanism that is movable between first and second positions adjacent the bottom wall.

36. The method of claim 35, further comprising:

preventing the material from coagulating along the bottom wall of the housing.

37. The method of claim 35, wherein the agitating step further comprises:

positioning an agitator frame having mixing members adjacent a fluidized medium; and

moving the agitator frame along a predetermined path and frequency.

38. The method of claim 35, further comprising:

removing any stagnant pockets of material.